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H. S. RANKIN

APPARATUS FOR MELTING PARAFFIN AND BASE SEDIMENT IN OIL WELLS

Filed April 15, 1921

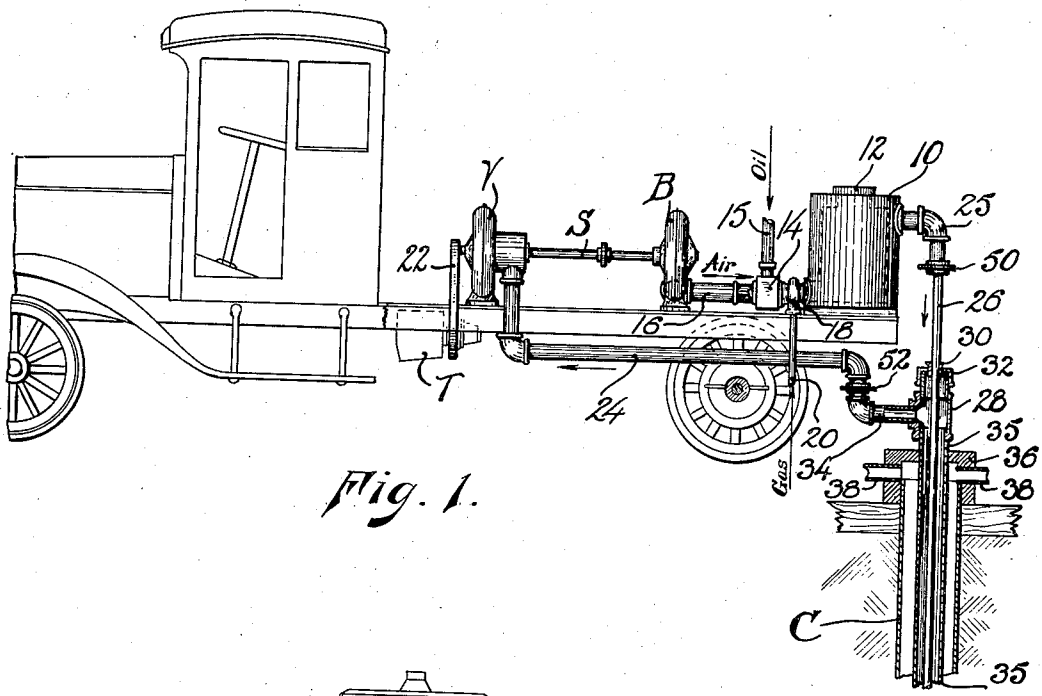


Fig. 1.

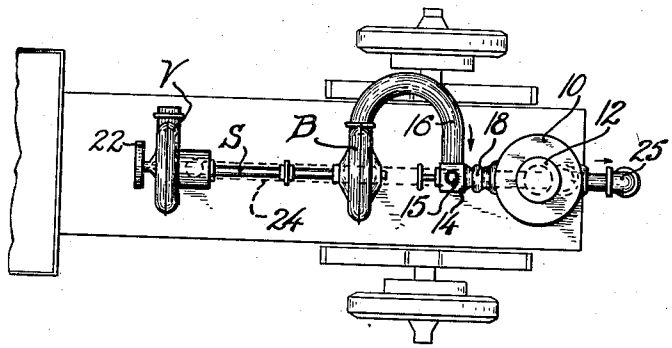
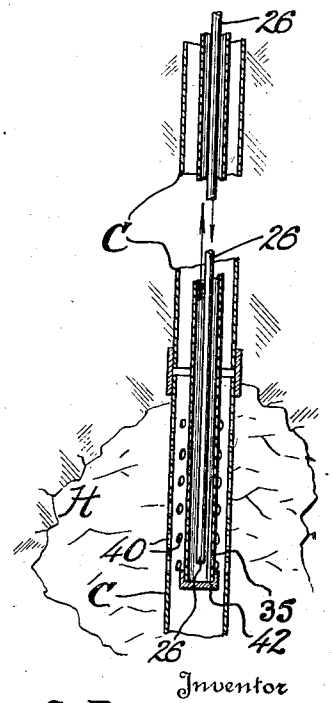


Fig. 2.



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APPARATUS FOR MELTING PARAFFIN AND BASE SEDIMENT IN OIL WELLS.

Application filed April 15, 1921. Serial No. 461,621.

To all whom it may concern:

Be it known that I, HERMAN S. RANKIN, a citizen of the United States, residing at Golden, in the county of Jefferson and State of Colorado, have invented certain new and useful Improvements in Apparatus for Melting Paraffin and Base Sediment in Oil Wells; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this specification.

The object of this invention is to provide a means for clearing oil wells which have become clogged by reason of solidified paraffin and base sediment.

Briefly, the invention comprises apparatus for the introduction of hot gases supplied by continuous combustion as from an oil burner into a closed member which has been lowered into the solidified matter in the well. The apparatus comprises a furnace or combustion chamber equipped with an oil burner, air being supplied to the burner by means of a blower. A pair of pipes are lowered into the well, one being smaller than the other and located within said other, the larger pipe being closed at its lower end. Hot gases are introduced into one pipe and drawn from the bottom thereof outward through the other, the vacuum pump being used to assist the operation.

In the drawings:

Fig. 1 is a view partially in side elevation and partially in section showing the apparatus in operative position; and

Fig. 2 is a plan thereof.

A motor truck is preferably provided, as illustrated in Fig. 1, for carrying the furnace or combustion chamber 10, a blower B and a vacuum pump V. The furnace 10 has an opening at the top thereof adapted to be closed by any suitable closure means 12. An oil burner 14 is mounted at one side of the furnace for providing fuel for continuous combustion within the furnace. An oil duct 15 leads to the burner 14 and a supply of air is conducted to said burner from the blower B by means of a conduit 16. The burner may also be supplied with a gas head 18 to which gas may be conducted through a pipe 20 so as to supply gas to the burner if desired.

The blower B is driven by a shaft S which also drives the vacuum pump V, the shaft S being in turn driven preferably by a silent chain 22 operated from a gear provided on the transmission T of the truck. A conduit 24 leads to the vacuum pump V, whereby spent gases are drawn out of the well.

The hot products of combustion formed in the furnace 10 through the medium of the burner 14 are withdrawn from the top of said furnace by means of a connection 25 which is adapted to be coupled up with a pipe 26 which is lowered into the well during operation. The pipe 26 is connected with a T 28 by means of a nipple 30 and a cap 32. The T 28 also has a short connection 34 adapted to be coupled to the vacuum conduit 24. The T 28 is secured on the upper end of a large conduit 35 which is mounted in the ordinary casing head 36 mounted on the casing C in lieu of the oil discharge pipe. The casing head 36 is shown with the ordinary gas discharge conduits 38. The casing C is shown as provided with the ordinary apertures 40 in the lower end thereof which is positioned within the shot hole H. The lower end of the large conduit 35 is closed by means of a cap 42 and the pipe 26 is lowered into the conduit 35 to a point adjacent said cap 42.

The connection 25 and the pipe 26 are provided with flanges 50 for coupling the same together and the vacuum conduit 24 and the connection 34 are provided with coupling flanges 52. After the conduit 35 and the pipe 26 have been lowered into position within the well and properly connected with the casing head 36, the truck is moved into position to bring the flanges 50 and 52 in coupling relation. The closure 12 is removed from the furnace 10 and the oil burner 14 is set in operation. When said burner has been operating long enough to generate the desired amount of heat and to place the furnace 10 in proper operating condition, the closure 12 is placed in position. This allows the vacuum pump V to operate through the conduits 24 and 35 to cause the hot products of combustion from the furnace 10 to circulate through conduit 35 and through the pipe 26. In this manner the blower B is tending to force said products of

combustion to the bottom of conduit 35 and the vacuum pump V is tending to draw them therefrom, blower B, however, is of such low pressure that the circulation is caused almost wholly by the vacuum pump.

Inasmuch as the oil burner operates continuously and is capable of generating a large amount of heat, the solidified paraffin and sediment in the bottom of the well will be quickly melted and the well restored to normal operating condition. By controlling the amount of oil or gas fed to the burner, the amount of heat generated in a unit of time may be controlled as desired. It has been found that a small amount of oil will enable a well to be melted and cleaned in a comparatively short time. The heat generated by the device may be further conserved by thoroughly insulating the furnace 10, the connection 25 and the pipe 26, said pipe 26 being preferably insulated to its lower end within the conduit 35 so that heat will not be transmitted from said pipe 26 to the gases in the upper end of conduit 35 which are being withdrawn. With this apparatus it will be easily possible to reach a temperature approximating 2000° F. in a very short interval of time and to maintain the same with ease until the well has been cleared.

I claim:

Apparatus for clearing oil wells comprising a furnace located at the top of the well, a blower, a pipe connecting the blower with the furnace for supplying a continuous flow of air to the latter, means connected with the pipe for delivering a continuous flow of fuel thereto in fluid form, means also located at the top of the well for producing a partial vacuum and means for connecting the furnace with the vacuum source comprising a closed loop extending to the bottom of the well and through which the products of combustion from the furnace are caused to pass by the vacuum producing means.

In testimony whereof I affix my signature.

HERMAN S. RANKIN.